

What is claimed is:

3 1. A method of scheduling data packet transmission in a data communication
4 network, comprising:

5 computing an arrival time for first data packet relative to a system clock value and
6 an arrival time for a second data packet relative to the system clock value, wherein the
7 system clock value returns to zero after reaching a maximum value;

8 determining a maximum range of arrival times for the first and second data
9 packets; and

10 determining which arrival time will occur earliest by determining whether a
11 difference between the arrival times for the first and second data packets exceeds the
12 maximum range.

1 2. The method according to claim 1, wherein said data packet arrival times are based
2 on a start of reception time, a data packet length and transmission speed.

1 3. The method according to claim 1, wherein a lower one of the arrival times occurs
2 earliest when the difference between the arrival times for the first and second data
3 packets does not exceed the maximum range.

1 4. The method according to claim 1, wherein a higher one of the arrival times occurs
2 earliest when the difference between the arrival times for the first and second data
3 packets exceeds the maximum range.

1 5. The method according to claim 1, further comprising arranging scheduling values
2 for the data packets in a scheduling heap data structure.

1 6. The method according to claim 1, further comprising prioritizing the data packets
2 according to their arrival times.

1 7. A method of scheduling data packet transmission in a data communication
2 network, comprising:

3 inserting scheduling values for received data packets into a scheduling heap data
4 structure;

5 arranging the scheduling values according to assigned priority levels; and

6 arranging scheduling values for selected data packets based on anticipated arrival
7 times for the data packets.

1 8. The method according to claim 7, wherein the scheduling values for the selected
2 data packets are arranged using weighted fair queuing.

1 9. The method according to claim 8, wherein the scheduling values for the selected
2 data packets include a priority value equal to that of a priority value of another data
3 packet.

1 10. The method according to claim 8, wherein the scheduling values for the selected
2 data packets lack a priority value.

1 11. A system for scheduling data packet transmission in a data communication
2 network, comprising:

3 a scheduling heap data structure having a plurality of levels for storing scheduling
4 values for data packets according to their relative priorities; and

5 a queue controller coupled to the data structure for manipulating scheduling
6 values in the heap data structure, the queue controller including an apparatus for
7 comparing anticipated arrival times for data packets including a first memory register for
8 storing a first arrival time, a second memory register for storing a second arrival time,
9 and logic for performing 2's complement subtraction on the first and second arrival
10 times, wherein a carry output of indicates which of the first and second arrival times
11 occurs earliest according to whether a difference between the first and second arrival
12 times exceeds a range of arrival times.

1 12. The system according to claim 11, wherein said data packet arrival times are
2 based on a start of reception time, a data packet length and transmission speed.

1 13. The system according to claim 11, further comprising arranging scheduling values
2 for the data packets in a scheduling heap data structure.

1 14. The system according to claim 11, further comprising prioritizing the data packets
2 according to their arrival times.